REMARKS

Claim 4 has been canceled without prejudice. Claims 1, 5, 6, 16 and 17 have been amended, and add new claims 20-25 have been added. In particular, independent claim 1 has been amended to improve grammar and punctuation and to recite that the "conductive paths...are made of essentially non-magnetic material" as supported on page 1, lines 6-10, and on page 3, lines 13-25, of the application as originally filed. Likewise, claims 5 and 6, which depend indirectly on claim 1, have been amended in accordance with the present amendment to claim 1. Claims 16 and 17 have been amended to improve grammar and clarity, and the present amendment has no limiting effect on the scope of these claims.

New claims 20 and 21 depend upon claims 5 and 6, respectfully, and recite that the "electronic unit is a capacitor." The subject matter of claims 20 and 21 was originally recited in claims 5 and 6, and now is recited in these dependent claims. New claim 22, depends upon claim 1, and recites subject matter of original claim 4.

New claim 23 has been added to recite a "timepiece" having features supported on page 2, lines 1-3 and lines 12-26, of the specification as originally filed. New dependent claim 24 depends upon claim 23 and further recites subject matter supported on page 3, lines 19-22, of the specification as originally filed. New claim 25 depends upon independent claim 23 and further recites subject matter supported on page 1, lines 6-10 and lines 27-32, of the specification as originally filed.

The present amendment adds no new matter to the instant application.

The Invention

The present invention pertains broadly to a timepiece, such as would have a microgenerator for powering various electronic and/or mechanical components of the timepiece. A first embodiment in accordance with the present invention is a timepiece having the features recited in claim 1. A second embodiment in accordance with the present invention is a timepiece having the features recited in claim 23. Various other embodiments in accordance with the present invention are recited in the present claims.

All of the embodiments, in accordance with the present invention, relate to a timepiece having "an electronic module including a support with conductive paths" wherein certain conductive paths are "made of essentially non-magnetic material." The phrase "non-magnetic material" has a specific definition as provided on page 1, lines 8-10, of the present invention.

The Rejections

Claims 1-17 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Schafroth (U.S. Patent 6,124,649) in view of Nelson (U.S. Patent 4,176,362).

Applicants respectfully traverse the rejection and request reconsideration of the application for the following reasons.

Applicants' Arguments

A patentability analysis under 35 U.S.C. § 103 requires (a) determining the scope and content of the prior art, (b) ascertaining the differences between the prior art and the claimed subject matter, (c) resolving the level of ordinary skill in the pertinent art, and (d)

considering secondary considerations that may serve as indicia of nonobviousness or obviousness. Graham v. John Deere Co. of Kansas City, 148 U.S.P.Q. 459, 467 (1966). Furthermore, a proper rejection under Section 103 further requires showing (1) that the prior art would have suggested to a person of ordinary skill in the art that they should make the claimed device or carry out the claimed process, (2) that the prior art would have revealed to a person of ordinary skill in the art that in so making or doing, there would have been a reasonable expectation of success, and (3) both the suggestion and the reasonable expectation of success must be found in the prior art and not in the applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991).

The Schafroth Patent

U.S. Patent 6,124,649 to Schafroth (hereafter, the Schafroth Patent) teaches a "micro-generator module and clockwork movement containing such a micro-generator" as shown in Figures 1 and 2. The Schafroth Patent teaches that the micro-generator includes a shaft (10) connected to a rotor, wherein the rotor includes an upper disk (11) and a lower disk (13). The disks (11) and (13) are made of sheet metal with high saturation (i.e., remanence about 2.4 Tesla), (col. 2, lines 58-62). Each disk (11) and (13) has six individual magnets glued thereon and disposed with north-south-north alternating polarity. A spring (not shown) drives seconds-wheel (71) mounted on seconds-arbor (70), and the seconds-wheel (71) drives first intermediate pinion (60) which, in turn, drives second intermediate pinion (50), (col. 2, lines 26-50). The second intermediate pinion (50) and its arbor are made of non-magnetic material such as copper-beryllium alloy (col. 2, lines 41-45).

The Schafroth Patent further teaches an electronic module (80) equipped with a micro-generator as shown in Figure 2, wherein the module includes three coils (20), (21) and (22) mounted between disks (11) and (13) and disposed so there is a space (18) between coils (20) and (21). This asymmetric arrangement of coils (20), (21) and (22) with respect to shaft (10) of the rotor makes it possible to mount the rotor after coils (20), (21) and (22) have been glued to the module (80), (col. 4, lines 54-63). An integrated circuit (81) is mounted on module (80) and is connected to monitor the rotational speed of the micro-generator and to adjust this speed by changing the value of a variable load resistor (col. 3, lines 60-64). The circuit includes a voltage tripler that uses three capacitors (82), (83) and (84), which are mounted to the module (80) outside of the integrated circuit (81).

The Schafroth Patent teaches that coils (20) and (22) are soldered or glued to the module (80) at point of connection (801), coils (21) and (22) are soldered or bonded to the module (80) at point of connection (802), coil (20) is soldered or bonded to point of connection (800), and coil (21) is soldered or bonded to point of connection (803). Thus, the Schafroth Patent teaches that the coils (20), (21) and (22) are connected in series between the points (800), (801), (802) and (803) so voltages produced by the coils are added (col. 3, lines 49-60). As shown by Figure 2, points (800), (801), (802) and (803) are connected by conducting paths on the printed circuit, which were made using conventional print circuit technology (col. 3, lines 54-60).

As admitted by the Examiner (Office Action, dated May 11, 2004, page 3, line 23, to page 4, line 2), the Schafroth Patent fails to teach, or even suggest, that the "conductive paths...have essentially non-magnetic properties" as recited in claim 1,

that "said conductive paths include a protective layer formed of a non-magnetic material" as recited in claim 2; that the "protective layer is made of nickel based alloy" as recited in claim 3; that "said conductive paths include an adherence underlayer formed of a non-magnetic material" as recited in claims 7-9; and that the "adherence underlayer is made of a nickel based alloy" as recited in claims 10 and 11 of the present application.

The Nelson Patent

U.S. Patent 4,176,362 to Nelson (hereafter, the Nelson Patent) teaches a "high density magnetic image recording head," such as recording head (12) of printing system (10) for forming magnetic images across the width of a magnetic tape (14) at a recording station (15), (See Figure 1). The magnetic images on the tape (14) are then transferred to a magnetic drum (18), and the images on the magnetic drum are used to print images on paper thereby enabling the system (10) to print multiple copies of a page (col. 2, lines 58-68).

The Nelson Patent teaches that an array (30) of recorder elements (32) for recording images on a magnetic tape or other magnetizable medium is used to construct the recording head (12) as shown in Figure 2. Each recorder element (32) includes a strip-shaped portion (34) with a recording location (36) therealong. As shown in Figure 3, the recording location (36) may have its magnetization changed so that a "spot" is recorded on the magnetic tape (38), (col. 3, lines 17-27). A person skilled in the art would recognize that the Nelson Patent pertains to the art of xerography and teaches structure for recording images on magnetic tape by selectively magnetizing a recording

location on a recording head (12). The Nelson Patent has absolutely nothing to do with an electronic module including conductive paths connected to at least one integrated circuit wherein those conductive paths located proximate to a functional unit have essentially non-magnetic properties. In other words, the Nelson Patent pertains to an unrelated and remote field of invention for the subject matter of the present invention.

As far as the recorder elements (32) are concerned, the Nelson Patent teaches that the recorder elements are constructed with two conductive layers (50) and (52), with one layer (50) constructed of highly conductive material copper, and the other layer (52) constructed of only moderately conductive material nickel (col. 3, lines 36-40). The two layered structure is provided so that current path (56), as shown in Figure 3, will veer and generate enough magnetism to magnetize the magnetic layer of the magnetic tape and record a spot thereon (col. 3, lines 42-54).

The Examiner has misapplied the teachings of the Nelson Patent. The Examiner provides no justification for using the nickel-copper strip-shaped portions (34) taught by Nelson in the device taught by Schlafroth (Office Action, page 4, lines 16-19). The Nelson Patent reasonably teaches the use of copper-nickel strips for magnetizing magnetic tape. The Nelson Patent does not teach, or even suggest, the application of "conductive paths...made of essentially non-magnetic material" as recited in independent claims 1 and 23, in accordance with the present invention.

A person skilled in the art would recognize from Applicants' disclosure that a "non-magnetic material" is not ferromagnetic, is not or is only slightly paramagnetic, and it may have a slight diamagnetism (See original specification, page 1, lines 8-10). The present specification explicitly distinguished "non-magnetic material," of the

present invention, with conventional nickel based alloys having ferromagnetic properties (See present specification, page 3, lines 13-15). A person skilled in the art would realize that the Nelson Patent teaches conventional nickel alloys having ferromagnetic properties because it is these ferromagnetic properties that are used by the recorder elements (32) to magnetize the magnetic tape (38).

The Section 103 Rejection

The Section 103 rejection is untenable and must be withdrawn because neither the Schafroth Patent nor the Nelson Patent teach, or even suggest "conductive paths...made of essentially non-magnetic material" as recited in independent claims 1 and 23. Therefore, there is no reason to combine the teachings of these two references because the Nelson Patent teaches the use of nickel-copper strips for generating spot magnetic fields, and there is simply no reason to apply technology for generating spot magnetic fields to Schafroth's microgenerator module technology. In fact, the teachings of the present specification suggest that such a structure would further brake the generator in view of the magnetic flux it would generate (See instant specification, page 3, lines 13-15).

Furthermore, neither the Schafroth Patent nor the Nelson Patent teach, or even suggest, the "essentially non-magnetic material is selected from the group consisting essentially of a nickel based alloy containing phosphorous and a palladium based alloy" as recited in new claim 25.

Conclusion

The rejection under 35 U.S.C. § 103(a) is untenable and must be withdrawn because neither the Schafroth Patent, nor the Nelson Patent, teach or suggest "conductive paths...made of essentially non-magnetic material" as recited in independent claims 1 and 23.

For all of the above reasons, claims 1-3 and 5-25 are in condition for allowance, and a prompt notice of allowance is earnestly solicited. Questions are welcomed by the below signed attorney of record for the Applicants.

Respectfully submitted,

GRIFFIN & SZIPL, PC

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